JOURNAL OF THE

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

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[The Association as a body is not responsible for statements or opinions of any of its members.]

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JANUARY QUARTERLY MEETING

OF THE

Massachusetts Association of Boards of Health.

The January quarterly (or regular annual) meeting of the Massachusetts Association of Boards of Health was held in Boston at the Parker House on the afternoon of Thursday, January 28, the President of the Association in the chair. Following is a report of the proceedings: —

THE PRESIDENT.— Will the Association come to order. The Secretary will read the records of the last meeting of the Association.

The records of the last meeting were then read and approved.

THE PRESIDENT.— The next business in order is the election of your officers for the ensuing year. What action will you take thereon?

SECRETARY FARNHAM.— I move that a committee of three be appointed by the Chair, Mr. President, to bring in a ticket.

The motion of Dr. Farnham was then put and unanimously carried. The President appointed the following members as such committee: Dr. Gage, of Lowell; Mr. Pilsbury, of Boston; Mr. Newcomb, of Salem.

THE PRESIDENT.— During the absence of this committee, I will ask the Treasurer to read his report for the year.

The report of the Treasurer was then read, as follows: —

TREASURER'S REPORT FOR 1896.

RECEIPTS.

Balance from 1895	$546.14
Annual assessments	236.00
	$782.14

EXPENDITURES.

Stenographic report of meetings	$123.25
Postage	10.67
Printing	15.40
Stationery and clerical assistance	10.83
Dinners for invited guests, cigars, etc.	16.80
Total expenditures	$176.95
Balance to 1897	605.19
	$782.14

Respectfully submitted,

JAMES B. FIELD, *Treasurer.*

Examined and approved as correctly cast and properly vouched.

WILLIAM P. BOWERS, *Auditor.*

THE PRESIDENT.— If there is no objection, the report of your Treasurer will be received and placed on file.

The Executive Committee desires to report to the Association the following-named persons as candidates for membership in this body: —

EDWIN E. WAITE, M.D.	New Bedford.
JAMES W. HOLLAND, M.D.	Westfield.
JOHN CRAWFORD	Cambridge.
EVERETT O. CLARK	Weston.

WILLIAM F. CURTIN	Lowell.
CHARLES L. FOX, M.D.	Lowell.
C. T. SYMMES	Lancaster.
H. M. NASH, M.D.	Lancaster.
F. A. WILLARD	Lancaster.
CHARLES H. PHIPPEN	Salem.
G. F. SIMPSON	North Adams.
A. W. BUCK, M.D.	Fall River.
DAVID D. BROUGH, M.D.	Boston.

Is it your pleasure that these named persons be elected members of this Association? If so, you will please signify it by saying aye.

The vote was then taken, and the above-named persons were unanimously elected members of the Association.

THE PRESIDENT,— Is there any incidental business that can properly come before the Association at this time while we are waiting for the report of the committee on officers for the ensuing year?

DR. DURGIN.— I should like, Mr. President, to give notice that I will bring in a resolution at the next meeting for the reduction of the annual dues from $2.00 to $1.50.

THE PRESIDENT.— Under our by-laws Dr. Durgin gives notice that at the next meeting he is to introduce a motion to reduce the annual assessment to $1.50, and action can then be taken upon this proposition.

In order that we may get at the work of this afternoon, Professor Sedgwick has kindly consented to read his paper now; and, when the committee come in with their report, we can make the necessary interruption.

ON THE PROTECTION OF PUBLIC MILK SUPPLIES FROM POLLUTION.

BY PROFESSOR W. T. SEDGWICK,

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

The milk-supply question is to-day perhaps the most pressing problem in American sanitation. The public has become tolerably well informed in regard to the dangers of impure water. City officials, engineers, and members of boards of health, physicians, sanitarians,— almost everybody,— now know that with water, as with many other things in this world, appearances are often deceitful, and that in the innocent-looking, sparkling glass of cold water, once the symbol of purity and the emblem of charity, may lurk the germs of disease, the messengers of death. In many States much still remains to be done, to be sure, in educating the people and in providing them with pure water; but in our own fair State, thanks to a wise and able State Board of Health supported by an enlightened and generous public opinion, this great work of education and provision is well advanced. And this is the more fortunate as it bids fair to enable us as sanitarians and guardians of the public health to begin to turn our attention to another aspect of preventive medicine, which urgently demands our most serious attention.

Next in magnitude and in importance to the question of water supply is that of milk supply. There can be no question of this. The only question is whether it stands next before or next after in urgency and importance. Like water, milk is a liquid, and hence favorable as a vehicle for micro-organisms. It is less used than water, but far better soil for bacteria to thrive upon. It is more costly than water, but still cheap and deservedly of high repute as food. It wears a heavy veil of white,— everywhere the emblem of purity and innocence; but there is only too much reason to fear that milk is often nevertheless wolfish, though arrayed in sheep's clothing. Water is, in essence, inorganic and not subject to decay: milk is a direct product of living animal tissues and, being richly

organic, is therefore highly putrescible. Water is usually served in towns and cities from tightly-closed pipes or vessels buried in the earth, so that it arrives in much the same condition as when it left its source. Milk is extensively manipulated by human agencies, transported in various vessels by wagon or by rail, and reaches the consumer in a totally different state from that in which it left its source,— the cow. The germs of most diseases die out in pure water. The germs of many diseases probably thrive in pure milk. In fine, milk, by virtue of its high reputation as a food, its veil of white, its richness in organic matters, its fluid consistency, and its cheapness, is an ideal vehicle for the distribution of disease germs, if these once find entrance into it. That disease germs do often find entrance into milk supplies is now a truism.

I have long dwelt publicly upon these facts, and from time to time, in epidemiological investigations for the State Board of Health, have had fresh and striking proof of their importance.

The great epidemic of typhoid fever in Springfield in 1892 taught Dr. Chapin and myself lessons in regard to milk and its dangers which we shall never forget. An epidemic of typhoid fever in Somerville in the same year led me to consider the part played in milk epidemiology by the *system of supply*, and similar epidemics during July, August, and September last in Cambridge, compelled me to return to the question. I had long suspected that the system of supply, or the handling, of the milk in Boston and vicinity was peculiar, and in some ways very objectionable from a sanitary point of view; and I was curious to know how it compared with the systems in vogue in other American cities and towns. On behalf of the State Board of Health I have, accordingly, recently visited the principal cities as far south as Washington, and made inquiries in cities as far westward as Chicago, in order to be able to compare the Boston system of supply with theirs. But, before describing the systems of supply in other cities, I ought, perhaps, to say something about the system in the Greater Boston, because, I dare say, there are members of this Association who are not familiar with the details of that system. In the matter of milk supply, as well as in other problems, it is necessary to go into details if one would fully understand the situation.

THE BOSTON SYSTEM OF MILK SUPPLY.

In Boston the milk is very largely railroad milk; that is, it comes from more or less remote towns as far west as the Hoosac Tunnel, and northward and southward nearly as far, and is brought in on trains in small cans,— small, I mean, as compared with those in use in other cities. As a result of what I have seen in other cities I am led to believe that in Boston the system is more differentiated, more highly developed, more admirably managed from an economic point of view than in any other city. It is controlled, according to a recent statement of Mr. Whitaker of the Dairy Bureau, largely by three men,— this railroad milk supply; and those men are known as "contractors." The trains, carrying the milk in eight-and-a-half-quart cans, come into the city, arriving, as a rule, about ten o'clock in the morning. The cans are then taken from the train by the local dealers, whom we may call local milkmen or pedlers, if we please, or dealers. They are not milkmen in the strict sense; at least, they are not cowmen, because they do not deal with the cows at all. They are local milkmen,— local dealers we may call them for convenience. The milk is taken by them to their headquarters or houses, which contain milk-rooms. These are too often closely connected with stables in which the horses are kept. It would not be fair to say exactly that the milk is handled in the stables; but the stables are generally only a few feet away, and the association of the horses with the milk is decidedly too close to satisfy good sanitary conditions. The milk-room is provided with ice-chests and the like and, what is of the highest importance, with one great "cooler," as it is called, or "mixer," a large tank holding the contents of a number of the cans,— perhaps ten, or even more in some cases. Over the top of this mixer is stretched, for a strainer, a cloth. At the bottom is a spigot.

All the cans, as soon as possible after they are brought into the milk-house, are "tasted." This is done often at the tail of the wagon, the can being simply tipped up on the tail-board and the plug knocked out; the man in charge "tasting" the milk to see if it is fresh. This is done as a protection to the dealer; for, if a can is sour, that can will be returned to the farmer from whom it came, and

of course the milkman does not pay for it. Now I cannot say that this is the first objectionable operation in the handling. One should begin, of course, with the conditions on the farm, in the stable, and all that; but I will pass that by. The time spent on the train is another element. I ought to have said that the milk brought in at 10 A.M. is generally that morning's milk and the milk of the night before. Arriving at ten or eleven o'clock, it is tasted and handled before noon. After the men have done their morning delivery in the early hours of the day, they go to the trains and get the cans for the next day's delivery, bringing them to the milk-house and tasting them soon after their arrival, in the way that I have described. Any sanitarian, I think, must stop right here, and say that this "tasting" system is most objectionable, because, even if we do not put the worst face upon it,— and I am very anxious not to do that because this is an important industry and concerns the welfare not only of dozens of farmers, but of dozens of other men whose living depends upon their successful handling of the milk,— I say even if they do not do the worst things that are suggested and said sometimes to be done (namely, take the milk into their mouths, taste it, and then return it to the can in order to lose no milk), yet the mere tasting and spitting of the milk out upon the floor is not a cleanly operation, as I have often seen it conducted; and, if the man who does it or the boy who does it happens to be suffering with an infectious disease, an early stage of diphtheria perhaps, it is not a pleasant thought that he has brought his lips in contact with a can the milk from which may find its way to your table or to mine. The tasting operation is, perhaps, almost essential, under our system, to protect the milk dealer. But we are not now considering chiefly what is essential or advantageous. We are considering what are the facts, as a basis for proper sanitary interpretation of the conditions. And at once we must set down the tasting operation, it seems to me, as highly objectionable from every point of view. I may say I found the same custom in most of the cities I visited,— Washington, Baltimore, etc.,— but not in New York. There is every reason to believe that the custom grew up before any one realized the dangers of it. All our ideas about infectious diseases are new. The germ theory did not get established until about fifteen years ago in any reason-

able fashion; and the germs of the principal infectious diseases were not worked out until a little later than that. So that it is not strange that this custom, pertaining really to a primitive period, should have grown up as it has and remained as it has.

The milk having been thus "tasted," the cans are emptied, one after another, in Boston,— this is all about Boston thus far; and I wish to emphasize some of these points, because they are peculiar to us, different from what we find in any other city; and I wish, moreover, to draw the conclusion which I believe to be perfectly just, that the system, while admirable from an economic point of view, from the point of view of convenience and all that, is, from a sanitary point of view, perhaps more objectionable than that of any other city that I have seen,— the cans, I repeat, are emptied through the cloth strainer into the "mixer," and their contents are thus mingled, the dealer often mixing milk that has come from several different farms, different dairies. I am thinking of one man who used about eighty cans a day. He derived them from as many, I should say, as eight or ten different dairies, some of course furnishing only one or two cans, others many more than that. And, as these are handled in the car and handled in the wagon, it is as likely as not that a can from dairy A may stand next to one from dairy B, and one from dairy B may stand next to one from dairy C; and then, one after another, their contents may go together into the mixer. Now, this is highly objectionable, because, if there is disease in the milk from any one farm, you have here a diluted mixture of the whole; and when the little cans are filled from the spigot below, as will shortly be described, an even dose, though perhaps a slight dose, is drawn off into each one of them. This "mixing" of various milks is also, not entirely but largely, peculiar to Boston, and objectionable from a sanitary point of view, as any sanitarian can see.

The next step is the filling of the little cans. And Boston is the only city that I have discovered in which the milkman furnishes such little cans, furnishes the receptacle for the consumer. In New York, Philadelphia, Washington, Baltimore, Albany, New Haven, Buffalo, Cleveland, and all other large cities that I know about, the consumer, except in the "bottle" trade, furnishes the receptacle.

The milkman deals out the milk from some receptacle of his own, which he uses over and over again. But once the milk has gone from his can, or whatever it may be, on the wagon, his connection with it has ceased; and, no matter whether there is typhoid fever or Asiatic cholera in the house which he serves, there is never any ready means of communication from the house back to his wagon. But see how it is in Boston. The milkman furnishes numerous quart or pint tin cans, which he fills at the spigot attached to the cooler. These small cans are then stowed in refrigerators and iced. If bottles are used, they are filled in the same way, essentially; and I shall have to say more about that in a moment. The small cans or bottles are filled from the spigot, with the hands of the operator passing over or near the mouth of the can. And if any one of those cans has received a germ or a number of germs from any source, although the ice reduces the temperature to a point at which growth is probably slight, yet there is possibility, especially if the ice happens to run a little short, of the germs growing in the little cans. These cans are kept on the ice until the next morning, thus of course adding to the age of the milk and giving further opportunity for germ growth. And this particular mixing and handling does not occur in any other city, because they do not put the milk in little cans at all. The milk stays in big (usually ten gallon) cans, the product of each dairy separate from that of every other.

Very early the next morning the dealer loads his wagon with the little cans and some eight-quart cans for the bakery and grocery and other "wholesale" trade. And the Boston wagon, I find, is also peculiar and not seen in any other city. It is very ingenious. One horse draws a good deal more milk here than anywhere else. We have arrived at a fine differentiation of the system, admirably arranged as it is from a business point of view. And those cans are left on the doorstep at an hour of the morning suggestive of freshness, although the milk they contain is really at least twenty-four, and often thirty-six, or even more, hours old. Now if the can which is left on my doorstep to-day was yesterday in a place where there was scarlet fever or diphtheria, or stood on a kitchen table in a tenement perhaps, there is a chance that it may have got contaminated, and then having gone back to the milk-house, and perhaps

not having been thoroughly washed, it may bring to me the next morning the germs of disease. I say no other city, as far as I know, anywhere, has our peculiar system. It is very convenient for the consumer. We do not have to provide any receptacle for the milk we buy. The servant-girl does not have to look out and have a bowl ready or a quart-cup. The milkman does it all. But from a sanitary point of view this must be regarded as an objectionable feature, because this system furnishes a possible bond of connection and the transfer of disease from house to house.

To return for a moment to the spigot and the filling of the little pint and quart cans, and also to the emptying of the big cans. If one of the men in the milk-house is in an early stage of typhoid fever; and if, as generally happens, there is a privy near by to which this man retires, with a mild diarrhœa perhaps; and if, further, as too often happens, he does not thoroughly clean his fingers on returning from the privy, but proceeds to empty the big cans into the cooler or to fill the little cans from the spigot,— it is not difficult to see that we have here an opportunity for contamination. In the principal Cambridge epidemic of 1896 I had every reason to believe that it was in some such way that the infection took place. The milk-farms from which the milk came were all right, as far as any one could discover,— they were even unusually good. We believed that the milk when it arrived in the city was in good condition, and also when it arrived in the milk-house. It was the milk-house of a careful, honest, and intelligent dealer. But it so happened that he had three helpers there who were, successively, in what we believe to have been an early stage of typhoid fever, basing our opinion upon expert medical evidence. We know that these people worked over the milk; and we know that there were eighty-six cases of typhoid fever more or less clearly due to that milk. There was nothing out of the way on the farms; but there were these people in an early stage of the disease in the milk-house, and they were working over the cans in this way. We know that they retired frequently to the privy, because they admitted it. They had bowel complaint, as they called it. And the privy was conveniently near, and not of a high grade. It was very easy to imagine, though not to prove — for there was no proof, it was strong

circumstantial evidence only — that the trouble might have come in that way.

Such, then, is the Boston system: railroad milk in large quantities and, at the sources, not differing much from the milk in any other city, brought on trains which arrive at ten o'clock in the morning,— a convenient hour for the milkman, but resulting in an age of the milk which is undesirable; taken to the milk-house and mixed in an unfortunate fashion; first tasted in a very unfortunate fashion, then mixed, drawn off into little cans through a spigot, by hand. And, if any one has watched that operation and knows how the "striker" operates, he knows how he throws the little cans in under the spigot one after another, his hands very often coming into the stream of milk, the connection between fingers and milk-can being of the most intimate sort, food and fingers getting mixed up in a very unpleasant way. And, finally, we have the system of little cans furnished by the dealer, and not by the consumer. It is necessary, it seems to me, to go minutely into these details, if we would inquire further into the methods of protection. We must know where the trouble comes from before we undertake to remedy it.

SYSTEMS OF MILK SUPPLY IN WASHINGTON AND BALTIMORE.

How is it in other cities? In Washington I find that quite a lot of railroad milk arrives in much the same way; but it comes, to begin with, not in eight-quart cans, but in forty-quart cans, big and heavy. These are taken from the station directly to the dairies, as they are called there, which correspond to our milk-houses. But there is no stable near, and no mixer. The cans are set right in big tubs of ice-cold water or ice, and the milk is kept *in the same cans* in which it arrives. The trains arrive at the same time as in Boston; and the next morning these cans are put into wagons, open in the middle, such as you have all seen in New York, but with a "churn," as it is called, beside the driver, in which the milk of one or two cans is mixed. It holds a good amount of milk, two or three cans, these being forty-quart cans: two, perhaps, are dumped into it, and then the milk is drawn out and sold. When that is drawn out, more milk is put in. But in both Washington and Baltimore, such

mixing as there is is done only just before delivery; and in both cities the milkman sits in the wagon. In Baltimore he rings a bell, which is a nuisance to any one trying to sleep in the morning, the ringing of bells all through the city being enough to drive any one distracted, if he is not a good sleeper. On the ringing of the bell, a servant is supposed to come out of the house with a quart-cup, or some receptacle, and get the milk. The day that I was there it was very cold, and the milkmen I happened to see did sometimes carry the milk into the house in their measure. But they poured it into something in the house, and brought nothing out of the house except what they had carried in for the moment only.

In Washington they are doing a good deal of bottle trade. In Baltimore and Philadelphia that is also being done a good deal, and in New York. But in all these places the health authorities regard it as objectionable, because it is an approach to the Boston system of furnishing the receptacle for the milk, and thus making a bond of connection which may wind in and out from the houses of the patrons to the milk establishment. They might also object to it for another reason, which they have not yet become familiar with; namely, that in the process of filling these bottles the milk from different dairies is necessarily mixed. In Washington I saw an ingenious bottling establishment where a big reservoir runs on a track,—a big wooden tub it really is, a square tub which runs on a track. In the bottom of the reservoir is a series of holes, with plugs. The bottles are put between the wheels on the track, and this receptacle is rolled along over the bottles. As it arrives over each row, the plugs are pulled out, the milk runs in, and the plugs are then put back. In order to accomplish this rapidly, the milk has to be mixed. In New York the Board of Health has very strict rules about the bottling of milk; but, in general, I may say that it is objected to by officials more on account of the bottles, which go from house to house, than on account of the mixing.

We are plainly dealing with a system which has slowly grown up, and it is very interesting to see how it has been evolved. We start with one family having one cow. Then come one hundred families and one hundred cows and a middleman must come in: if we have a thousand families and a thousand cows, we must have

more middlemen. And when we reach a hundred thousand families and a hundred thousand cows, we have to draw from all the neighboring States. The matter has become an immense *system.* It is evidently an evolution made necessary by the development of the community from village life up to urban life.

The Baltimore system is a good deal like the Washington system. I should have said that they have two deliveries a day in Washington. The reason for this is because it is a warmer climate. In Baltimore the reform administration has established some very good laboratories; and the chemical, and even, indeed, the bacteriological, examination of milk is undertaken to some extent. And yet their laws or rules are defective; the courts do not support them very well, and the principal remedy which they seem to have is what they call "spilling." They spill the milk at the borders or frontiers of the city, at the railway stations, if they find it bad. And while that does away with the milk, it does not of course really meet the case as well as the system of inspection and penalties that we have here. There is some mixing there, and there is some bottle trade; but most of the milk is delivered from the single can just as it comes from the farm, without having been mixed with the milk from any other dairy. Dr. Stokes, the bacteriologist of the health department, an excellent pathologist, has lately reported a form of diseased milk which was new to me. I should like to touch on it for a moment, because it seems to me a remarkable and interesting case. The milk inspectors in Baltimore noticed that one of the samples of milk seemed to be very rich and creamy, but at the same time somehow did not look right. On studying into it with a centrifugal machine and a microscope, they found that it was filled with pus. I quote from the original paper by Dr. Stokes and Dr. Clement, State veterinarian:* —

> Dr. Clement "was called upon professionally in August to attend a herd of cattle which, as the owners said, were 'milking pus.' I found a herd of about seventy cows all affected to a greater or less extent. They were all nearly dry, and what milk could be obtained was of a thick, yellowish nature. The cows stood in a double row of stanchions. The history obtained, after careful inquiry, was that the disease first appeared in one cow; that the owner's attention was

* *Maryland Medical Journal,* Jan. 9, 1897.

called to the condition of the milk by the retailers who bought it. The infection spread to the rest of the herd with great rapidity, so that in the course of two or three weeks the whole herd had become affected.

"These cattle were at the time on pasture, fed twice a day on mill feed, and, according to the foreman's statement, milked regularly. Further inquiry brought forth the information that a strange man had hired out on the farm, who was an experienced milker, but who sought professional advice from the physician attending the family for a sore upon his finger, which he said he got from milking cows on a large dairy farm in York, Pa. This man left the place in about a week; and a few days after his departure the disease appeared in the first cow, soon followed by its appearance in the rest of the herd. Cleanliness and irrigation with warm water gradually caused the animals to become dry, in which condition they have remained up to the present time. A complete autopsy was made upon one of the cows, but nothing abnormal was made out, with the exception of a purulent inflammation of the somewhat dilated milk ducts. Cultures from the blood of the beast and the internal viscera remained sterile."

THE SYSTEM OF MILK SUPPLY IN PHILADELPHIA.

In Philadelphia the amount of milk which is used is of course great. A very large amount of it (seven-eighths) comes on the railway. It is taken from the trains in the original forty-quart cans directly to tubs of ice-water, and kept and cooled until the next morning. The trains arrive, as here, in the morning; and there is not very much to be learned from the Philadelphia system that I have not already mentioned for other cities, excepting with regard to a few points. In the first place, they have pretty strict rules about tuberculosis, regarding which the following Resolutions with Preamble attached were adopted by the Board of Health of Philadelphia on Oct. 16, 1894: —

Whereas it has been decided by competent authority that physical examination alone is an uncertain and therefore unreliable means of determining the freedom of cattle from tuberculosis; and

Whereas the tuberculin test is the only means of detecting many occult cases of this disease, and is therefore indispensable in arriving at the knowledge that a herd of cattle is free from tuberculosis,— therefore

Resolved, that the Chief Inspector of Milk be and is hereby instructed to indorse as *untrustworthy* all certificates of the freedom of herds of milch cows from tuberculosis that are not based upon the use of the tuberculin test by trained veterinarians.

Resolved, That the Chief Inspector of Milk keep a book in which shall be

registered all herds of milch cows that supply the city of Philadelphia that have been certified as free from tuberculosis by the method approved by the Board of Health, also of such as have not been thus reliably certified, and which are therefore "suspicious," which records shall be open to the inspection of the public. Said records shall contain the names of the dealers supplied by such herds.

Resolved, That all producers of milk supplying the city of Philadelphia who fail after sixty days' notice to furnish a certificate or clean bill of health of their cattle, based on the method of examination demanded by experts and approved by the Board of Health, shall be reported to the board, and be liable to have their milk rejected as being "*suspicious*."

In this connection I may remark that in several cities grocers and small dealers in milk are obliged to keep posted in plain sight a placard stating the sources of the milk which they are selling, so that, in case an epidemic occurs, or anything of that sort, an inspector could see at a glance where that milk came from. I think that this would be a great help anywhere. One of the chief things an epidemiologist has to do in a milk epidemic is to hunt about and find out where the milk comes from, and this often takes a great deal of time and trouble.

One of the interesting things in Philadelphia is its attitude toward skimmed milk and what they call "creamery slop" or "creamery refuse." They make a special point of this. They say that skimmed milk is one thing; hand-skimmed contains 1.75 per cent. to 3 per cent. butter fat, dependent on the method of setting; while creamery refuse contains from 0.1 to 0.3 of 1 per cent. of butter fat. That is, one is 1.75 to 3, and the other is from 0.1 to 0.3 of 1 per cent. Inspector Burns is very earnest upon this subject: he has, as the phrase is, "no use" at all for the material left by the separator, the milk which we should commonly call separator-skimmed milk; and the Board of Health of Philadelphia does not allow it to come into the city at all, but designates it by such names as "milk refuse," and "separator slop." If any one is interested in it, there is a long legal discussion in the Report for 1895 in regard to these matters, with a charge from Judge Hare covering several pages, which of course I cannot go into now. I may add that in New York no skimmed, or otherwise robbed, milk — that is, no milk except whole milk — is allowed to be sold or admitted to the city *in any form*.

The New York Board of Health takes the ground that if they once admit such a thing as skimmed milk into the city, it will surely get mixed with the whole milk, even although it is printed on it that it is skimmed, in letters of Gothic, etc.: it is a great deal better, they hold, to keep it out altogether, and they take that stand very strongly and in spite of the possible food value of such milk. In Philadelphia they admit the ordinary skimmed milk, but refuse skimmed milk derived from the separator.

THE SYSTEM OF MILK SUPPLY IN NEW YORK.

New York is, on the whole, it seems to me, by far the most interesting and instructive of our neighboring cities in every respect as regards its milk supply, because, in the first place, although it draws milk from as far away as Pittsfield, Mass., and Hornellsville in the western part of the State of New York, it has a very useful set of maps and a card catalogue showing exactly the districts from which the milk supply is derived. Then they have no contractor system in New York. There are one or two rather large wholesalers, but not very large. And the milk which comes on the trains for New York and Brooklyn — for it very largely comes through New York to Brooklyn, Long Island not supplying milk enough — arrives and is delivered to the consumer from these great distances as fresh in point of time as the milk that reaches Boston from a town like Acton, a point relatively near to Boston. In other words, it is so arranged that the trains arrive in the city from 9 P.M. to 7 A.M. They do not come in, as they do with us, at 10 in the morning: they arrive in the evening and the night. And the dealers, who are in communication with the farms from which the milk comes,— they are not buying through great contractors for the most part,— go to the train, take the cans, which are forty-quart or twenty-quart cans mostly, upon the wagons which are familiar to all visitors to New York,— those wagons having an opening in the middle, the man sitting with some cans in front of him and some cans behind him. They do not take the cans to milk-houses and taste them there. They do not mix their contents at all. They do not put the milk in little cans. The consumer furnishes the recepta-

cle. So that it actually turns out that the milk delivered in New York is first, as fresh as the milk delivered in Boston; and it is delivered in the "original packages," so to speak, which is, I hold, a very important sanitary matter, because, even if there is infection in one forty-quart can, it is limited to that can, it is not mixed up with a lot of others and sent about in numerous little cans.

And the care of the milk and the rules for the registration of the dealers are remarkably good. Here, for instance, is a blank. I should say, right here, that a great deal of the milk that comes to New York comes from creameries, the creamery not being always what we understand as a creamery in the first instance, but really a milk-house in the country, a sort of clearing-house in a country town. A great deal of the milk also is condensed milk,— not what we buy as condensed milk, but more like what the New England Kitchen sells as evaporated milk. And the New York Board of Health obliges each owner of a creamery or condensary to fill out a blank such as I have here. This bears the name of the owner of the creamery, shipping station (county and State and railroad), states at what time the milk is shipped, how many hours in transit on the train, the nature of the water supply in the creameries, the number of cans per day, the number of quarts in bottles. A good many bottles are shipped, but the Board has a very strict rule about bottles. Then below you have the name of the farmer, number of cows, breed of cows, system of water supply for washing cans, etc. The rules which govern these things are very strict. I won't go through all of them. With regard to their skimmed milk, the rule is this, the first rule of the sanitary code governing milk: —

SECTION 186. No milk which has been watered, adulterated, reduced or changed in any respect by the addition of water, or other substance, or by the removal of cream, shall be brought into, held, kept, or offered for sale at any place in the city of New York, nor shall any one keep, have, or offer for sale in the said city any such milk.

With regard to bottling in the city: —

Milk must not be transferred from cans to bottles or other vessels on streets, or on ferries, or at depots, except when transferred to vessel of purchaser at time of delivery.

And further with regard to the bottle business: —

Milk shall not be sold in bottles except under the following rules: —

Bottles must be washed clean with a hot-water solution of soap, or soda, or some other alkali, and then with hot water before filling with milk.

Bottles must not be filled except at the dairy or creamery, and in the city only in rooms so situated as to prevent the contamination of the milk by dust from the streets or other impurities.

Bottles must not be washed or filled with milk in any room used for sleeping or domestic purposes or opening into the same.

Regarding store licenses: —

Store permits must be posted in stores so that they can be easily seen at all times.

Of course, as everybody knows, all rules and laws depend for their value upon the way in which they are carried out. But I was given to understand that in New York these rules are carried out with marked success. Dr. Martin, to whom I am especially indebted, seemed to me to have an admirably equipped department admirably administered.

My time, I see, is gone; and I ought to stop here. But I want to make just one remark upon the recent report of Mr. Whitaker, of the Milk Producers' Union. Mr. Whitaker, after saying that the year has been an excellent one for production, says that there has been, if anything, an overproduction, and yet not quite that. Here are his own words, "One cause of the surplus in Boston is under-consumption." Mr. Whitaker goes on to say that the public does not realize the food value of milk. I should doubt that. It seems to me the public has been brought up to believe that milk is the one thing we can rely on, that it is remarkably cheap and digestible; that if we want a convenient, cheap, and digestible food, milk meets those requirements. But Mr. Whitaker says: "The public does not appreciate and realize the food value of milk. When hard times come on and economies are necessary, milk is regarded as a luxury to be curtailed." I doubt that very much. "Truer economy would insist on using more milk and less meat. The consumption of milk has been decreased by the increasing use of condensed milk, which comes from greater distance, and by the increasing use of cream," etc.

Now I think one great reason for the diminished use of milk — for Mr. Whitaker shows there is actually less of it used *per capita* than before — is that the public is beginning to get waked up on this matter. The public is beginning to feel anxious about the sanitary condition of milk. I confess I have done a good deal to stimulate that uneasiness, and I intend to continue doing it; for I believe that the milk-supply problem is one of the very serious things of the day, from a sanitary point of view. And instead of claiming that the public does not understand the value of milk, I think it would be a great deal better for persons interested to try to take pains to assure the public that the milk is in the best possible sanitary condition. I think there is grave danger that the public shall lose confidence in milk. At a meeting which I attended a few evenings ago some one suggested that the only safe attitude in regard to milk is total abstinence. That, certainly, if it became common, would diminish the use of milk still further than it has been diminished thus far.

There are many other interesting points in this subject which I should like to touch upon, with regard to the standard, for example. It seems to me that Mr. Whitaker is very wise there. He does not believe in any reduction of the standard, because that would let in more milk, and milk of lower grade.

The conclusion of this whole matter, as far as I am concerned, is that, in my opinion, the detailed administration of the milk business leaves much to be desired. What, then, are the remedies? That, of course, is always the difficult thing. How can we provide any adequate protection of the milk supply? After talking with a good many different people and thinking the thing over a good deal, I have about come to this conclusion: The local board of health in any city interested in the milk supply has got to make rules that no milk shall be sold in that city which it has reason to regard as suspicious. And, in order to determine its condition, it has got to employ skilled veterinarians and sanitary inspectors to visit the farms and see that things are done there somewhat as they should be done. Whether they can add to that successfully chemical and bacteriological examination remains to be seen. I do not think that that question can be settled off-hand. But I think it has got to

come down to this: If any community wants to be sure of the excellence of its milk supply, it has got to put in the hands of its own board of health authority to exclude from the city or town all milk concerning the character of which the board of health is not well satisfied upon reasonable scientific grounds. And it has got to provide that board of health with money enough to employ the necessary assistance to carry out such inspection and regulations. Take Cambridge, for instance. That is a case I have in mind. No milk ought to be delivered in the city of Cambridge about which the Board of Health has not a good deal of information. It is simply a question of expense and proper administration to look after the farmers supplying Cambridge. Tell the milkmen, "If you want to send milk to Cambridge, you have got to clean up, you have got to have your cows examined by our veterinary, you have got to satisfy us, from the cleanness and the freshness of your milk, that you are doing your best." It may be that the board of health in question must be able to prove the presence of dirt or decay or some other unsanitary condition in the milk as it arrives; but I fancy it would be sufficient to publish lists of approved dairies, and let the citizens do the rest. Then the dealers must either meet the requirements or send the milk somewhere else. I see no escape at present from something of this sort. It is expensive. It involves further administration on the part of boards of health, but I believe it is a sanitary necessity which is coming upon us now very fast.

THE PRESIDENT.— Before proceeding to the discussion of this very interesting paper of Professor Sedgwick's, I will submit to you the report of your Nominating Committee, Dr. Gage having unfortunately been obliged to leave the room. They present the following names:

President.

HENRY P. WALCOTT, M.D.

Vice-Presidents.

S. H. DURGIN, M.D. S. W. ABBOTT, M.D.

Secretary.

EDWIN FARNHAM, M.D.

Treasurer.

JAMES B. FIELD, M.D.

Executive Committee.

J. C. COFFEY, ESQ. W. H. CHAPIN, M.D.
J. A. GAGE, M.D. H. L. CHASE, M.D.
R. L. NEWCOMB, ESQ.

What action will you take upon the report of your committee?

DR. DURGIN.— I move that the Secretary be authorized to cast the ballot of the Association for the officers named.

Dr. Durgin's motion was unanimously carried.

THE PRESIDENT.— The Secretary informs me that the ballot cast for the officers of this Association contains the names which I have read to you. The discussion of Professor Sedgwick's paper is now in order. Dr. Chapin may possibly say something to us upon that subject.

REMARKS OF DR. CHAPIN, OF SPRINGFIELD.

It seems to me that the first thing to be done to prevent the contamination of our milk is to educate the people. There never was so good a thing happened to the city of Springfield as the epidemic of typhoid fever in 1892, and the appearance of Dr. Sedgwick in search of the cause, the appearance of the health officers from house to house, asking everywhere about the milk. The prolonged search, which was a great bother to both Professor Sedgwick and myself, was in the end a good thing; for, when we got through with a two months' search for the cause of the epidemic of typhoid fever, nearly everybody in Springfield knew that in some way or other, at some times, milk does make people sick. And they have not forgotten it. And, what is better than that, all milk dealers except the one that peddled this milk believed the same thing, too, and they still believe it. And I have had more than once, and more than ten times, perhaps, in the last two years, a milk dealer come to me personally and say, "Doctor, I am a little suspicious about a case of sickness over

in Suffield, Conn.; and would you mind going down there with me?" "Oh, no; not at all. I should like to go." And I would go down there, and either condemn the farm as being infected with a contagious disease or pass it by as probably free from such contagion.

Last summer, about the first day of June, I had reports in one day from two physicians. And, by the way, the physicians got educated, too; everybody took part in that education,— nothing like stirring things up. On one day two physicians reported to me as follows: Dr. A. stopped me on the street. He said: "I have two families in which there is typhoid fever. One has three cases, and the other four. They are both supplied by such a milk dealer." Ten minutes after that I had another report from another physician, that he had a case of typhoid fever which he had found out was supplied with milk by this same milk dealer. They had taken the pains to do the search work for me and to report to me. The result was that in about three hours from the reports of those cases I had the case of typhoid fever which produced an epidemic of about eighteen cases. Within three hours of the first report I had the case located. As I say, the education of the people, of the physicians, and of the milk dealers, is the thing to begin with. But with all sorts of education there will come a case now and then where milk will be polluted, without any possibility of help. For instance, in the epidemic which I have just mentioned, a servant-girl began working on the farm on the third day of May, and on the twenty-first day, or about the twenty-first day, of May, she went away from the place sick, having been on the farm only three weeks. So far as the people on the farm knew, she had malaria. And they were honest about it. I traced the case back to Springfield, where she was then residing, and found her on a sick-bed with typhoid fever, as I expected she would be. I judged from the number of cases that she helped with only one or two cans; in some way or other she had to do with only one can, I think, and there were about ten families infected with typhoid from that cause. Now, no amount of caution would prevent that, that I know of. But when the people of the State, and the people of Boston particularly, look upon raw milk as being as bad as raw beans, then we shall be a great deal better off than now. I wouldn't

drink a glass of raw milk. I have had enough of it. I had four weeks on my back from it. I had typhoid fever. So, I say, educate the people in the city, the consumers of milk, to the belief that milk is a danger; teach them that sterilized milk is better than raw milk, and let them demand of their dealers that their milk shall be properly prepared.

In order to get at the farmer, it seems to me that a better way than to put the matter in the hands of local boards of health would be to appoint a district inspector of dairies. It is not necessary to examine every dairy in one day; and one inspector might cover considerable territory. If he did that, inspecting the cows as regards the health of the cows, particularly in regard to tuberculosis, cleanliness of the stables, and cleanliness on the farm, we might possibly educate the farmer to keep them clean. What time in the morning do you suppose the average farmer washes his hands for the first time? I suspect about breakfast time, after the milking is done. All milk that contains sand, manure, hair, ought to be rejected without any question whatever, as being filthy. And yet people will take that kind of milk without making much fuss about it. They do not look upon a teaspoonful or so of cow manure in the bottom of a quart-cup as very bad. Possibly they may say something the following day to the milkman about it, but they take the milk just the same. I think that is true,— I know that is true. I was brought up on a farm. The most sensible food that we have upon our tables is produced in the filthiest localities possible. Now, no farmer ever thinks, as far as I know, of ever washing the cow's udder or of washing his hands before he goes to milking. I think there are some cases where they do, but they are few.

THE PRESIDENT.— Dr. Chapin, I hope your namesake of Providence can give us some more assurance of a better condition of things in Rhode Island.

REMARKS OF DR. CHAPIN, OF PROVIDENCE.

When Dr. Chapin said that he did not think the farmers washed their hands until breakfast time, I felt like offering an amendment.

We have in Providence recently established a model dairy farm, which I think *is* a model farm. And near by it is one of the old-fashioned kind. But the man on the old-fashioned farm felt that, if the model farm was going to start in and run competition against him, he would have to do something. So he determined to furnish milk which would be as clean as the other man's. I visited his farm and saw the men at milking time. I had just come from the model farm, and knew how they took care of the cows' udders and sterilized their glass jars, etc. And so I asked him various questions as to what he did. I asked him if they wiped the cows' udders, and if the men washed their hands. And he said yes. And I examined the men's hands, and I concluded that instead of washing them before breakfast they washed them about supper time, the time of the last milking. He told me that they always wiped off the udders with a dry cloth, because a damp cloth was bad for them. I asked him to step to the barn and show me the cloth. He stepped to the barn, and said, "Bill, where is that cloth that you wash off the udders with?" The man said, "I don't know." He said, "You are sitting on it." He said, "No, that is it out there." He got it and showed it to me. It was full of dust; it hadn't been taken down for a couple of months. So I think things are even worse in Providence.

I think you will find that Rhode Island people usually come to Massachusetts to receive rather than give. I came down here to receive information, and I have received a good deal of very useful information in regard to the management of the milk supply. And it seems to me that the difficulties have not been exaggerated. So what we have to do, if we want a milk supply which is clean and free from disease, is to make all the people that handle that milk, from the time that it leaves the udders of the cows until it is delivered to the customers, clean. And that is quite a contract. We have got to make them clean. If they will be cleanly, the dangers of receiving contagious diseases will be reduced to a minimum; though, even if they are cleanly, we cannot get rid of the danger entirely.

The points which Professor Sedgwick alluded to in regard to the different ways in which milk is delivered in different cities impressed me a good deal, as I was thinking of the way it was delivered in

Providence. It is quite different from the way it is delivered in Boston. Most of the milk in Providence is brought from the farm to the customer in a ten-gallon can. Some of it is brought in on the cars and mixed by the milk dealer, but very little of it. Most of it is either brought in in wagons or in cars in ten-gallon cans, and at the door is poured into the customer's measure.

We have not had much contagion due to milk. We have had within the last ten years only two or three epidemics, only one of which could be positively traced to the milk supply. It seems to me the chief way we can guard against this is to secure through the whole district from which the milk comes a thorough control of contagious diseases. When I said that Rhode Island people expect to receive from Massachusetts, I did not mean they expected to receive contagious disease. But it sometimes happens that in Providence we are liable to receive that very thing. I have at the present time a milkman who lives in Massachusetts, who has a case of scarlet fever in his family. He is still delivering milk, because I had a consultation with his physician and found that the case was very well isolated indeed, so that there was no danger in his continuing to deliver the milk. Last fall I learned of a case of typhoid on a milk farm in Massachusetts; and in that case I was not at all satisfied that it would be safe to have the milk brought into Providence, and I notified the man that he should not do it, and he did not do it. I also notified the secretary of the State Board of Health of Massachusetts in order that he might see that the milk was not delivered to customers in Massachusetts. I believe it was fed to a hog.

It seems to me that the only thing that we can do is to do that very expensive thing which Professor Sedgwick has suggested,— that we shall have a constant inspection of the sources of milk supply.

DR. CHAPIN, of Springfield.— I should like to mention a fact that happened within the last two years in Springfield. A cow was quarantined for tuberculosis. The farmer was somewhat sceptical. He was obliged, however, to throw away the milk, and fed it to some kittens. The kittens are dead, and the autopsy has shown tuberculosis. And the farmer is converted.

THE PRESIDENT.— Perhaps Professor Ernst will help us out.

REMARKS OF PROFESSOR ERNST.

Most of what I should have liked to say has already been said, so that there is very little left for me to add.

In regard to the general subject there does not seem to be any question that there is but one way in which the milk supply can be regulated and improved; and that is, a campaign of education so far as cleanliness is concerned. The stories that I have heard, and what I have seen of the surroundings of cows and of places from which the milk comes, are something almost unbelievable. The knowledge upon the subject is at such an extremely low ebb that I agree with Dr. Chapin in the feeling that it is a difficult problem to solve, a difficult matter to bring to a successful conclusion.

There are one or two points that struck me in what Professor Sedgwick said,— one in particular, laying so much stress upon the disadvantages of mixing milk,— that are so entirely contrary to my own feeling that I thought I would speak of them. The fact of mixing milk, it does not seem to me, is a matter of so much importance, provided this question of cleanliness is sufficiently well understood. The advice that I have given to my patients for years, and especially in feeding children, is, if they cannot get their milk supply from a single cow that they know, to be sure not to depend upon a milkman's single cow's milk, for the very reason that, if the cow be affected, for example, with tuberculosis, the chances of infection from a mixed supply seem to me to be very much less than the chances of infection from a single supply,— in accordance with experiments which are so well known, showing that it is not only the variety of the infectious microbe that is used, but the size of the dose that determines the results. So that, if the conditions of cleanliness are fulfilled, it would seem to me it is a little better to have a mixed supply than an unmixed. The forty-quart cans spoken of must contain mixed milk, and it must be mixed somewhere, because no single cow ever gives such a supply of milk; and in the creameries in New York State, outside of the city limits, the milk must be mixed there in order to fill the forty-quart cans.

There is another point of interest to me, from a scientific point of view, but I think Professor Sedgwick has already given the answer

to it. I have been interested to know whether, in any of his investigations, he has ever found in any of these cases the specific micro-organism of typhoid fever. I understood it was distinctly stated that the evidence was circumstantial entirely, but I wished to be sure that there is no direct evidence.

I think Dr. Chapin, of Springfield, insisted upon the use of sterilized milk at all times, which rather roused me, because I believe that the fad for sterilized milk has done more harm than it has good to the digestive apparatus of the coming generation. I think the use of sterilized milk on all occasions for children is a great mistake. I speak with feeling about it, because, so far as I know, the first sterilized milk that was ever used in this country was given to a patient of mine; but it was used for a definite purpose and with a definite idea of obtaining results in that case. I agree most heartily with Professor Sedgwick that the campaign of education, as regards cleanliness in the handling of the milk supply, is a necessity; but I believe it to be a great mistake to sterilize milk at all times for healthy babies, because it puts what seems to me to be an entirely unnecessary strain upon the digestive apparatus of those using it, especially of children. I do not think children should be fed with sterilized milk unless there already exists some disturbance of the digestive apparatus, when the object of the sterilization is to prevent the addition of further ferments to the excess already present.

THE PRESIDENT.— I suppose we shall all have to admit that there really are two sides to this question; that, while there is milk which is not looked after and not cared for and not conscientiously treated, there is fortunately a certain amount of milk which receives everything that conscientious care and intelligent supervision can give to it. And I am going to ask our guest, Mr. French, to tell us something about that. No man knows more about it than he does.

REMARKS OF MR. FRENCH.

Mr. President and Gentlemen,— I have been very much interested in the milk question, I might say ever since I was an infant; and I do not know that it is necessary to go back any farther than that.

If I was to take any text on which to speak to-day, it would be some resolutions which I had the honor of offering at the annual meeting of the Bay State Agricultural Society, which was held here on the 20th, and which read something as follows: —

Whereas the object of all laws in relation to contagious diseases in cattle is for the protection of the consumer of meat and the products of the dairy, and whereas a large amount of milk from other States is brought into the State of Massachusetts without any guarantee as to the freedom from disease,

Resolved, That our present State laws are insufficient, so far as they give no adequate protection to the consumer from milk from diseased herds outside of our State;

Resolved, That the Bay State Agricultural Society hereby offer a petition to the legislature now in session to take such action as will authorize the State Board of Health to make such regulations for the importation and sale of milk as will protect the inhabitants from the consumption of milk from diseased cows.

Now, I am assuming in this, or have assumed, that the State laws now were not sufficient to authorize the boards of health to take action in relation to milk outside of the State. Whether this could be done by ordinance or not, I am not prepared to say. In the city of Minneapolis it has been done by ordinance, and that ordinance has been sustained there in the State of Minnesota by the action of the Supreme Court. I have here a decision by the Supreme Court of the State of Minnesota, sustaining the milk and dairy ordinance of the city of Minneapolis providing for the inspection of dairy herds outside of the city and the use of the tuberculin test. Now, of course it is different in the city of Minneapolis, because a large portion or probably the whole of the milk that is brought into the city of Minneapolis comes from the State of Minnesota. Of course we cannot enact what might be called an extra-territorial law here which would govern the milk supply or regulate the milk supply in other States. But we do know here that as high as 40 per cent.,— it is so estimated by the Dairy Bureau,— as high as 40 per cent. of the milk that comes into the city of Boston comes from outside of this State. It comes from the State of Maine where, until a short time ago, it was supposed there was very little tuberculosis. And now it is estimated as high as 20 per cent. Large quantities come from that State. There are carloads of milk which come from New

Hampshire, and likewise from Vermont. I believe there are two carloads of milk that come from Connecticut. Now, under the general laws, as I understand, of the State of Massachusetts, the State Board of Health has power to inspect milk so far as adulteration is concerned and so far as they can detect disease here. But they have no authority, at least I assume they have not, to lay down laws and regulations in regard to the sale of milk in the city, so far as suspecting disease is concerned. We do not propose to interfere at all in any such legislation as may be desired with reference to what might be called the Interstate Commerce law. We would not say that you cannot bring any milk here. We cannot prevent carloads of milk from being brought in here if you choose. But what we want is that the State Board or the city Board of Health here in the city shall be able to say, if they are not already authorized so to say, that the milk when it comes here is under their care and inspection,— that is all. Of course you can detect adulteration, but you cannot detect disease until some unfortunate victim has been afflicted. Now, what we desire is, if a law is necessary, to have a law that will give the State Board power to say, "You may bring in all the milk that you want here, but, when it gets here, it is under our inspection," and to allow them to lay down such rules and regulations as shall govern it when it is here as they have done in Minnesota. Say to the milk contractors and to the milk dealers, "When you bring your milk in here from outside the State, you must be subject to these regulations."

Here is this great loophole. We pass laws here in regard to our own cattle and our own cows,— pass those laws here at the State House, and say to the farmers here that they must have their herds inspected, and that they must not send milk from diseased cows; and yet we allow this large percentage of milk to come in with perfect freedom without any inspection whatsoever. Now, we want the State Board to be allowed to lay down such regulations that they can say to the contractors and milkmen who bring in milk here from outside of the State, "You must prove to us that the milk that you bring in from outside of the State is not from diseased herds; that the sanitary conditions are likewise proper."

Now, that is the point, Mr. President, that I wish to emphasize, so

that the milk from the dairies outside of the State that comes in here shall be accompanied by certificates from the State Cattle Commissioners or from the sanitary inspectors there, or from veterinary authority of some kind, that every dairy that sends milk in here from outside the State shall be inspected at least twice a year, and that the milk shall be accompanied with proper certificates, stating that the herd from which it comes is kept under proper sanitary conditions, and that the cattle are not diseased.

I do not know, Mr. President, that I have anything more to say except, if the boards of health consider this of sufficient importance, and if they have not sufficient power or authority at the present time, as I have assumed they have not, to do this thing, the Bay State Agricultural Society and other societies, I think, will be very glad to co-operate with them in asking for more legislation if it is desired. But it does seem to me that this is a matter that has been overlooked. Certainly I have never heard it discussed or talked of in any of the milk meetings of the milk associations or any other assemblies, in relation to this large amount of milk that is brought in from outside the State without any guarantee as to freedom from disease.

CLOSING REMARKS OF PROFESSOR SEDGWICK.

I might say just one word, perhaps, in the way of closing the discussion. It seems to me that the secret here is, just as it is everywhere else, a campaign of agitation and education. It is not that we are prejudiced against the farmer. Most of us are closely connected with the farming community, and have ourselves, perhaps, as Dr. Chapin says, been brought up on farms. We know the difficulties in the way, and we dislike to put burdens upon people who are little able to bear them. But sanitary science has its requirements; and an enlightened public opinion is going to demand a much more careful supervision of all this matter of milk supply, unless I am very much mistaken, and that in the near future.

Obviously, it would be unwise for any State to enact strict rules for the governance of its own citizens, and then by some loophole allow citizens of other States to bring into the State materials which it would not tolerate from its own citizens, if there is any possible

way of preventing it. And I think we are indebted to Mr. French for calling our attention to this side of the matter.

With regard to the whole question, it seems to me we want to take this ground: We have got to be patient. Milk supply is a primitive industry. It goes back to the time when man led a pastoral life and lived with his flocks and herds. The good opinion of milk is based on that long acquaintance and experience with it. We still believe, as Dr. Ernst very wisely says, that, if only we could enforce cleanliness, all things would be well. The secret of modern sanitation is in one simple phrase, "Be clean." It is so in antiseptic surgery, it is so in everything sanitary.

In regard to mixing milk, which Dr. Ernst has referred to, it was not so much that I had in mind the mixing of the milk of different cows in the same dairy — though that of course is objectionable — as the mixing of the milk of the different dairies. So that, if there was a case of typhoid fever or scarlet fever upon one dairy,— I was thinking more particularly of human diseases when I spoke,— there would be trouble; and I meant diseases arising in that particular instance from a human being through the mixing of the milk from different dairies. That seemed to me, and does still, very objectionable, although I see the point, of course, of diluting the germs. However, under the Boston system you must bear in mind that the milk is kept in the little can after it is thus diluted; and the chance is that the germs are going to grow more or less.

I forgot to say, what I am very glad Dr. Ernst stated, about pasteurized milk. Sterilized milk is somewhat under a cloud, as he says, as being comparatively indigestible, besides the reputation which it must bear of, rarely, producing scurvy; and pasteurized milk, probably to a less extent, also. At the same time there are nations, I believe, which live upon boiled milk and are thriving. And it is here, it seems to me, simply a question of choice whether we should have more damage or less by sterilizing or pasteurizing than we now have with raw milk. There are grave dangers no doubt connected with the indigestibility of cooked milk. But those dangers are trifling, it seems to me, compared with those which pertain to raw milk. If we could get raw milk, as Dr. Ernst says, that is in its right condition, fresh and clean, I think I should be dis-

posed to agree with him. But the human race being what it is, and the historical development of mankind being what it is, I can simply say that personally I never think of drinking any milk that has not been boiled or pasteurized. The results of pasteurizing, from a bacteriological point of view, are very striking. We can reduce the number of germs from millions down to units by comparatively slight pasteurizing. And it seems to me that this is a very great safeguard, although we must always bear in mind, of course, the possible danger of occasional cases of scurvy, and those other things which enter into the problem.

DR. DURGIN.— I think this interesting address and discussion this afternoon must have impressed every one present with the need of some action. And, in order that we may pursue this subject farther and get the best results from it, I want to move that a committee of five be appointed by the President, who shall draw up a set of rules for adoption by boards of health within the State, and also a set of rules for investigating cases and epidemics of disease which may result from such polluted milk. I make that motion.

The motion was then unanimously carried.

THE PRESIDENT.— I will designate as the members of that committee Professor Sedgwick, Dr. W. H. Chapin, Dr. Burr, Mr. Parker, and Mr. Gove.

The next business upon our programme is a paper upon the "Danger from Lingering Diphtheria Bacilli in Convalescents from Diphtheria," by Professor Ernst. I have the pleasure of introducing him.

ADDRESS OF PROFESSOR ERNST.

Mr. President and Gentlemen,— I am sorry to say that I have no paper to present to you this afternoon. When Dr. Durgin spoke to me about speaking on this subject several weeks ago, I asked very earnestly to have it put off until some actual evidence in regard to the matter might be secured. But it seemed to him to be one of so much importance that it would be better to say what little I have

to say this afternoon, and then, perhaps later, give what evidence we may collect from an experimental point of view. So I shall detain you only a very short time to-day, the especial point under discussion apparently being how far boards of health are justified in enforcing quarantine upon patients convalescent from diphtheria, upon the ground of the persistence of cultures of the bacilli of diphtheria in the throat after all symptoms have disappeared. These cases are apparently becoming more and more annoying at the offices of the boards of health. I do not know whether they are becoming more numerous so far as concerns the office or not. Certainly, they do not become more numerous so far as our experience in carrying on the culture diagnosis goes. The particular point, of course, in justifying the insistence upon quarantine after all the symptoms have disappeared, lies in the question of the virulence of the bacilli that are found in the throats of such persons; and that is the particular point upon which very little evidence is yet obtained. There has been plenty of experimental work done as far as testing the virulence of bacilli that have lingered in the throats of patients for one, two, or three weeks; but those are not the cases in point. What are under consideration are the cases that are detained in quarantine four, five, or six weeks, or longer. It seemed to me that I had a number of such cases upon the records during the last year; but, on the contrary, I find there are only a very few. I mean where the virulence of the cultures has been tested in these prolonged cases. It has happened a number of times, in cases of persistent bacilli, that we have been requested to test the virulence of the cultures; but, before we could get the test made, negative cultures have come in, and the patient has been discharged from quarantine, so that the work has not been completed.

As to the frequency of these prolonged cases, I feel at liberty to quote something that I said in my report to the Boston Board of Health last year, as follows: "Complaint occurs in cases of diphtheria in which cultures have persisted and quarantine has been enforced upon patients for what has seemed to be an unreasonably long time; and from what has been said it might be thought that this happens more frequently than is actually the case."

Then, in order to demonstrate that this was true, I made out a table from all cases sent in to the laboratory at the medical school from Sept. 1, 1895, to Jan. 1, 1896. That, of course, is a year ago, but a very rough casting-up of the amount this year shows the proportions hold about the same. In those four months there were sent to us 2,443 cases. Out of these 2,443 cases for examination, 909 showed the presence of bacilli of diphtheria. Of those 909 the bacilli persisted over two weeks in 116 cases. But 63 of the 116 were discharged in from two to three weeks; 30 in from three to four weeks; 11 in from four to five weeks; 7 in from five to six weeks; 4 in from six to seven weeks; and 1 was detained in quarantine, or at least showed the presence of bacilli for a period of time between seven and eight weeks. That is, 1 out of 909 cases. And it appears also from a summary of this table that 93 were free at the end of four weeks, 93 out of 116; and that only 23 out of 909 were kept in quarantine for a longer time.

Now, taking into consideration the fact (for it is a fact so far as our records show) that a very large number are discharged in less than two weeks,— a much shorter time than was formerly considered wise,— and the added safety that is given by keeping these delayed cases under observation, it does not seem as if any reasonable person should object, even at the expense of apparent hardship in a few cases. Such apparent hardship is certainly for the benefit of the community and the associates of the patient as well. But it seems that it is these few cases that make the trouble, and of course it is a question as to whether it is justifiable to keep them under observation and under control upon the mere presence of the bacilli. This can only be determined by a series of experiments upon the virulence of the bacilli found in the cases of persistent bacilli sent in to us; and that particular point is the point that we have not yet had time to work out. In general, it is only possible to say that in practically every case that I have found in the literature of the subject, where there has been any experiment made, the test of the virulence has been made within two weeks of the date of the first culture. But the point is to be made that also in practically every case of this kind the bacilli have been shown to possess a marked degree of virulence by the fact that the guinea-pigs inoculated have

died within four days, and generally within forty-eight hours, which is a high degree of virulence. Where the dose of the injection is noted in such cases on our records, it has always been in the neighborhood of a tenth of a cubic centimetre and in a large-sized guinea-pig,— an adult guinea-pig, one weighing from five to seven or eight hundred grammes,— which is very much more difficult to affect by the injection of such a culture than a guinea-pig of a younger age and smaller weight. So that it would seem, so far as these few statistics go, that we have been able to get, that the virulence of the bacilli in this short time may be assumed. Now, on the other hand,— and these are the particular cases under discussion,— there have occurred a few cases in which the bacilli have persisted for a long time and in which the inoculation test has been made. I have, of my own, four; and, in looking up the literature on the subject, I find only two where, in these prolonged cases, the virulence of the cultures has been tested. There may be more, of course; but I did not happen to run across them. One was some two or three years ago, by Martha, who found the virulent bacilli in a case of a convalescent from diphtheria, in which the symptoms had entirely disappeared, nine weeks after the disappearance of the symptoms.

Biggs, in 1894, reports a case of persistent bacilli, and virulence shown seven weeks after all the symptoms had disappeared.

And, as I say, there may be others. I wrote to New York last week, hoping I should be able to get their latest statistics, but I have not yet received their reply.

Of the cases of our own, one was first sent in to us on the 5th of January, 1896, and the cultures came in on the 22d and 31st of January; on the 9th, 19th, and 28th of February; and the 11th and 20th of March. On the last date the culture was negative. On the 11th a guinea-pig was inoculated, and the virulence of the culture was demonstrated without question, the guinea-pig dying in forty-eight hours.

Then comes our most remarkable case, which I think Dr. Abbott matched just before we came in to dinner. This is the most prolonged case that I know of, the first culture having been sent to us on the 25th of April, last spring, and cultures coming in on the 28th and 30th of April (all of them positive, all of them showing bacilli of

diphtheria, except where I shall speak of it); on the 5th of May, the 10th, 12th, 17th, 26th, and 30th of May; on the 2d, 5th, 7th, 9th, 11th, 13th, 16th, 18th, 19th, 20th, 21st, 23d, 25th, 26th, 28th, 30th of June; and the 2d, 7th, 9th, 14th, 21st, 25th, and 28th of July; the 4th, 11th, 19th, and 25th of August; the 1st, 9th, 15th, 22d, 29th of September; and the 5th and 6th of October. And on the last two dates, the 5th and 6th of October, we got two successive negative cultures. The middle of September — that is, nearly five months after the symptoms had disappeared — the culture from that throat killed a guinea-pig in thirty-six hours, one of the most virulent cultures that we have had to deal with.

The third case was sent in in November of last fall; and then on the 28th of November; the 5th, 12th, 18th, 23d, 29th of December; and 3d, 6th, and 13th of January of this year. A guinea-pig inoculated with the culture January 3 died in forty-eight hours. On the 13th we got a negative culture.

Another case, coming in on November 20; cultures were sent in on the 26th and 30th of November; and on the 2d, 4th, 6th, 8th, 11th, 14th, 17th, 19th, 22d, 24th, 27th, and 31st of December; and on the 2d, 5th, 10th, 13th of January of this year. On the 16th there was a negative culture; and the culture made on the 13th did not kill a guinea-pig, so that the test showed that the case might have been discharged; but the case was discharged because of the entire disappearance of bacilli before we could complete the experiment. So that, so far as I can present any evidence, it would appear unquestionable that these prolonged cases do, as a rule, present bacilli that are virulent upon cultivation and inoculation.

The point that has been raised, that the bacilli while in the throats of persons where all symptoms have disappeared are non-virulent, and that their virulence is brought back to them by the inoculation experiment, seems to me to be not well taken, because, as far as I know, no increase of virulence ever occurs in bacteria except by being passed through living tissues. The increase of virulence, therefore, does not present itself in the preparation of the pure culture before injection is made. I know of no way by which the virulence can be increased by simple transfer of the bacteria on the ordinary nutrient medium. They either retain their virulence or lose

it: they do not gain. Therefore, the objection that these inoculation experiments are not reliable so far as demonstrating the virulence of the bacilli is concerned does not seem to me to be a proper one.

I am sorry that I have not more evidence to bring before you; but, from what little I have, my impression is a strong one, and I think others working in the same line agree with me, that these cases of prolonged diphtheria probably are even more dangerous sources of infection to others than those in which the symptoms are more marked, for the reason that, the symptoms being entirely gone, the patients do not realize that, while they are not dangerous to themselves, they may very probably be sources of infection to others, and particularly to children with whom they may come in contact and upon whom they may confer caresses.

DR. DURGIN.— I should like to add just one word to the force of Professor Ernst's remarks, and that is this: I think that one of the chief objects of this Association is, through the discussions, to bring about a uniform method of applying regulations throughout the State. If one board of health has a regulation or a rule to apply concerning contagious diseases, all boards throughout the State should have a similar one in order to strengthen one another. One board of health quarantines diphtheria cases until a negative culture has been obtained. A neighboring board of health does not do it. And in a short time there is discontent growing out of the laxity in one case and the stringent rules in the other. It seems to me that we ought to agree upon rules which may be applied throughout the State. And here is one of the opportunities. If these bacilli found in the throat are capable of killing a guinea-pig, according to Professor Ernst, they are capable of producing other cases of diphtheria in a human subject, and are therefore dangerous. If one board of health quarantines until a certain time, the other boards of the State should do the same thing. Otherwise, we should all withdraw from that position, the same as in the case of the milk regulations.

It was protested in my office yesterday that these bacilli remaining in the throat for so many weeks were harmless and would not produce the same disease in another individual, even though they had an opportunity to be communicated. I have asked Professor Ernst

to clear up that point; and he has done it well, I think. Still, it was protested that these bacilli were inert until handled by the bacteriologist, when they were cultivated into activity and the fact used against the poor fellow who was quarantined. I hope that that point has been made sufficiently clear by Professor Ernst. It seems to me it has.

PROFESSOR ERNST.— I should like to ask Professor Sedgwick what his experience is in regard to the increase of virulence.

PROFESSOR SEDGWICK.— I do very little in this line and know very little about it; but, what little I do know, I should think Professor Ernst's point was very well taken. It is just as reasonable to suppose — no more reasonable to suppose — that the bacillus is inert in the mouth and virulent a little while after as it would be to suppose that a potato changes its character when it comes out of the cellar, and is not the same sort of a potato it was when it was in the cellar. It seems to me that the thing is absurd on the face of it, a purely gratuitous assumption. If there is any evidence of it, we should like to have it. But, as a bacteriologist, though I have not worked in this particular line, it seems to me Professor Ernst's position is perfectly sound.

THE PRESIDENT.— Is there anything more to be said upon the subject upon which Professor Ernst has spoken to you?

MR. GOVE.— I should like to ask one practical question; and that is, in these cases of persistent bacilli, after an apparent recovery, what, if anything, can be done to hasten their disappearance?

PROFESSOR ERNST.— Did you ask me the question?

MR. GOVE.— Yes.

PROFESSOR ERNST.— I should be very glad to be able to answer it, but nothing that I have ever known has hastened the disappearance. They seem to go when they get ready. I should suppose, unquestionably, that frequent cleansing of the mouth would help. But I doubt very much whether germicides of so dilute a character as it would be justifiable to use are of any value.

PROFESSOR SEDGWICK.— I should like to suggest a practical experiment I have made on other bacteria, not on these at all. Bacilli are very susceptible to certain things; and it did seem to me, as the conversation was going on, that it ought to be possible to de-

vise some antiseptic in sufficient dilution, but of such a character as to do away with these things. For instance, they are very susceptible to some kinds of acids, most of them. And, while I am saying this purely in the air and without any knowledge of the particular bacillus in question, on general principles I should suppose that mouth-washes of dilute acids, dilute enough to hold in the mouth a moment, and perhaps such a thing as peroxide of hydrogen, something of that sort, might help very much. But I really do not know.

PROFESSOR ERNST.— Peroxide of hydrogen and washes of that sort have been tried very constantly, and they do lead to a very marked diminution. But, where the experiment has been tried, in the course of a day or two the bacilli will reappear. They seem to be in the follicles of the tonsils where you cannot get at them, and where the application of the various antiseptic washes clears them off the surface. But that is what I meant when I said "sufficiently diluted" to make it justifiable to apply them. In such dilution as that it does not penetrate deeply enough to clear the mouth from these deeper bacilli.

DR. CHAPIN, of Providence.— What Professor Ernst has just said leads me to ask him about cases where they are discharged from quarantine when they show one negative culture. We have had successive cultures taken to the State Laboratory, where they examined them and sometimes found a negative culture, and then a day or two afterwards reported a positive culture. Now, I have found such cases in other cities. I know it has been so in Brooklyn and in Philadelphia. And I should like to ask him what his experience is in reference to finding a positive culture one day and a negative culture subsequent to that, and then a positive again.

PROFESSOR ERNST.— That sometimes occurs, but it is very rare. It did happen in this prolonged case I read you. At one time in June, in the middle of June, a negative culture came in: the report was sent to the Board of Health; and the agent very promptly disinfected the house, and the patient was freed from quarantine and immediately went out of town. Then the physician, as a matter of curiosity, sent a culture in two days afterwards, and it was positive, and positive for two months, and the patient did not come back to

Boston. The parents did not care to come back, and they kept the child out of town. It did happen in that instance, but it is not common at all.

DR. DURGIN.— I want to say I think most of you, if you should sit in my office one day, would be glad to get a negative culture; and you would hurry to discharge the patient before they had time to get another positive culture. I think, if there is anything connected with the laws in regard to contagious diseases that is annoying, it is in trying to hold on to a case of diphtheria at the end of six, seven, or eight weeks, after all visible signs of the disease have gone; and the parents and all their political friends are after you to get you to discharge that patient and take down the card.

DR. CHAPIN.— And the doctor, sometimes.

DR. DURGIN.— Yes.

PROFESSOR ERNST.— Generally, the doctor.

DR. DURGIN.— And, if there is anything to be found that will dig out the pockets of that throat and clear away these little bacilli and allow us to pull down the card and discharge that patient, I wish it might be found.

PROFESSOR ERNST.— Possibly some physicians may do as a gentleman told me that he had done. I believe he is also a friend of the Board of Health. He told me this in confidence. He said that he could get rid of a patient, that he could work it every time. I asked him how he did it. "Well," he said, "I got a negative culture from you. I took that culture from another throat." And that patient was discharged on that.

DR. DURGIN.— We are accustomed to believe anything that Dr. Ernst sends us, and therefore we shall act upon it at once.

PROFESSOR ERNST.— I did not know that, sir, for two months afterward.

THE PRESIDENT.— It seems to me, if this meeting goes on much longer, the solid foundations of sanitary science will shake. I think it is about time somebody moved to adjourn.

On motion of Dr. Durgin the meeting was then adjourned.

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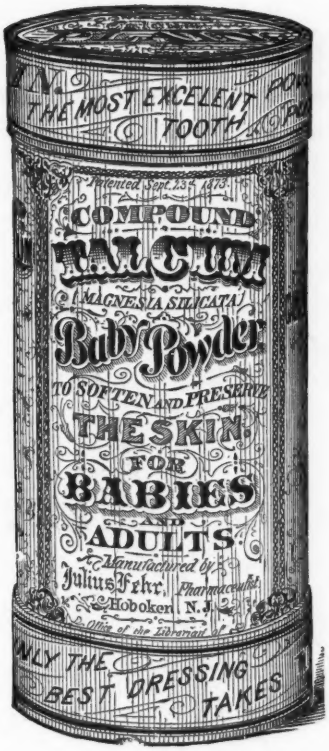

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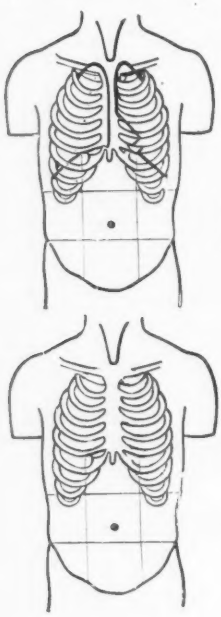

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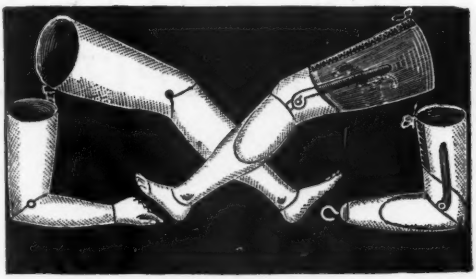

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Prices reasonable. All orders promptly filled.

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Powdered Spanish Castile Soap,

Olive Oil, and

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The Soap is a STRICTLY PURE Olive Oil Soap; and the Powder is superior to any in the market, as it never becomes rancid. . . . . . .

PURE BUTTER FOR HOSPITALS.

As we own our own creameries, we can supply the purest butter to our customers direct, thus saving two profits, the wholesale and retail.

Our Best Brand Clover Leaf Creamery.

In 5 lb. tubs, 80c.; in 10 lb. tubs, $1.50; in 20 lb. tubs, $2.90.

We also have good grades at 12c. per pound. Mail orders promptly attended to at short notice.

GINTER PRODUCE CO.,

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Fine Groceries.

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beg to announce that they have issued an Index of the first six volumes of the Journal of the Massachusetts Association of Boards of Health, compiled by Dr. S. W. Abbott.

It has been distributed to all Members of the Association, but any other persons desiring a copy may obtain it gratis by sending a one-cent stamp for mailing.

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A trial will convince you of its merit.

KING ARTHUR FLOUR

Makes the whitest and most nutritious bread.

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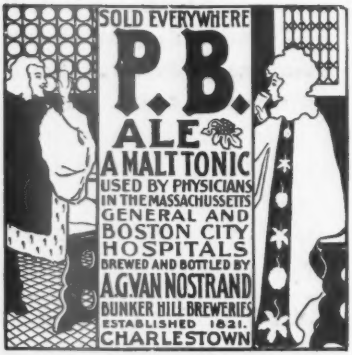
FOUR MILLION BARRELS MADE AND SOLD LAST YEAR



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Pure Milk and Cream Delivered in Glass Jars.

Specialties in Milk and Cream, Fresh Churned Butter, Fresh Laid Eggs, Domestic and Imported Cheese.

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CLEANSER, DISINFECTANT, DEODORIZER, ANTISEPTIC, and for EXTERNAL USE. NON-CORROSIVE.

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"GERMOL" is a powerful and valuable disinfectant, and owes its activity to the large proportions of phenols it contains. It forms a fine emulsion with water, and, when mixed with any fluid intended to be disinfected, has no tendency to separate.

(Signed) TATLOCK, READMAN & THOMPSON,
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HOSPITALS, HOTELS, FACTORIES, SHIPS, STABLES, DWELLINGS, TENEMENTS, SCHOOLS, CATTLE-SHEDS, SLAUGHTER-HOUSES, RAILWAY STATIONS, BREWERIES, FERRY-BOATS, WATER-CLOSETS, PRIVIES, SINKS, KENNELS, ORCHARDS, GROVES, GARDEN PLANTS OF ALL KINDS, HORSES, CATTLE, SHEEP, FOWL, DOGS, ETC.

DINSMORE & BAKER, Sole Agents for Massachusetts, Maine, New Hampshire, Vermont, and Rhode Island.

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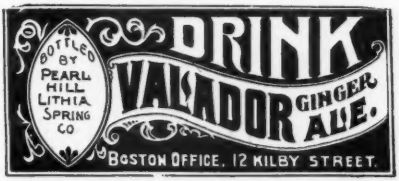

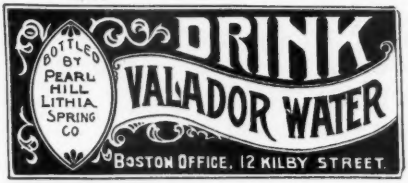

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Contains a minimum amount of alcohol and a maximum amount of malt extract.

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Poland Water by a continuous record of well-authenticated cures, extending over a period of more than fifty years, has demonstrated the genuineness of its claims that it is the purest mineral water obtainable, and that it is a specific of the highest value in all disorders of the stomach, bowels, kidneys, and urinary organs. It has long been prescribed freely by the best physicians, and has never failed to produce beneficial results.

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FORMALINE, FORMOL, AND FORMALDEHYDE GENERATOR.

A New and Most Efficient Method for Disinfection.

FORMALDEHYDE (CH_2O) is a gaseous body which is prepared by subjecting Methylalcohol to oxidization, which has PROVEN ITSELF AN EXCELLENT DISINFECTANT AND ANTISEPTIC. It has extraordinarily active MICROBICIDE POWER, similar to sublimate, is comparatively NON-POISONOUS, attacks only the substance of the contagious material, and is very readily employed under all circumstances. Its efficient employment as an antiseptic for disinfection of rooms and buildings has been proven, owing to its volatile nature.

THEODORE METCALF COMPANY, PHARMACEUTICAL CHEMISTS AND WHOLESALE DRUGGISTS, 39 Tremont Street (also Copley Square), BOSTON, MASS.

To Superintendents of Hospitals and Physicians.

STERILIZED HOSPITAL ABSORBENT COTTON.

All of **OUR GOODS ARE IN LAYERS**, rolled in tissue. Our long experience in the manufacture of absorbent cotton leads us to say that we are producing a line of goods superior to any Absorbent Cotton in the market.

THE DEDHAM ABSORBENT GAUZE

Is noted for its soft, silky feeling, and is entirely free from all sizing, and is particularly adapted for surgical dressings and sterilized sponges. It is used by the Boston City Hospital, the Massachusetts General, and the Johns Hopkins, and by a large number of small hospitals. Physicians order it in 100-yard rolls for their private practice.

We should be pleased to supply you at a very low price.

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FRED'K E. CLAPP & CO.,

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Messrs. Clark and Roberts invite attention to their large stock of Fine Liquors, which has been selected by them with especial regard to the requirements of **Druggists and Physicians,** for both Family and Medicinal uses. . . . . .

OUR SPECIALTIES.

Whiskies. **Old Reserve Rye** (ten years old), **Susquehanna Rye, Sunnyside Rye, Finche's Golden Wedding,** and **Cutter Rye** (all six years old), **Good Luck, Horseshoe, Golden Sheaf, Cutter,** and **Cook's Bourbon Whiskies** (four and five years old).

Wines and Brandy. Fine Imported Sherry and Port. **Old Boutelleau Brandy. Vve. Amiot Champagne. Equal to the best. $25.00 per case.**

Ales and Beer. Agents for **Evans & Son's India Pale Ale.** The only perfect bottled ale in the market. Old and mellow, bright, sparkling, free from sediment, and of exquisite flavor.
Sole agents for **Quandt Brewing Company's Victor Lager Beer,** pure and wholesome, put up in flint bottles, with white porcelain stoppers. This beer will keep fresh and sweet for two months.
Bottlers of **Bass's Ale, Bass's Brown Stout, Crown Diamond Ale,** and **McCormick's Cream Ale** and **Porter.**

Ginger Ale, Cider, Etc. Sole manufacturers of **Victor Ginger Ale, Victor Sarsaparilla, Victor Lemonette, Victor Crab-apple Cider, Victor Blood Orange Phosphate,** and other flavors. All made from pure extracts, pure fruit syrups, pure sugar, and pure water.

ALL GOODS SENT NEATLY AND SECURELY PACKED FOR PRICES, ADDRESS

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You cannot afford to be Careless about the Bread your Patients eat.

Have you ever seen the methods employed by the ordinary baker? If so, are they not suggestive of anything but healthy conditions? Give this matter your immediate attention. Place a loaf of bread (ordinary) under a glass: **ONE LOOK** will suffice.

We have made a careful study of the art of bread-making, therefore **MUST EXCEL** in our specialty. We are represented in nearly all the larger cities of New England, and are appointing new agencies every day in other States. You will confer a great favor by advising us of any town or city that is not being supplied with our goods.

A trial of the goods is sufficient to convince any intelligent person that they are what we claim them to be. The price is no advance over any other, and the goods are to be found at all well-appointed grocers'.

We are the originators of a wax wrapper, as applied to bread, and own and control the above **TRADE-MARK**.

Why Physicians should insist upon the use of SÉVIGNÉ BREAD in every Hospital and in every Household.

1st. **Because** it is made under the most healthy conditions.

2d. **Because** it is protected from all uncleanliness from the oven to the table by a specially prepared paraffine wrapper, and has no chance to become contaminated, as is the case with ordinary bread.

3d. **Because** the material is the best obtainable.

4th. **Because** it bears our **Trade-mark**, which is a guarantee that it is the **best** that money and skilled labor can produce.

"I have proven, by the microscope and other tests, in comparison with other breads, its compactness and freeness from all impurities, and heartily recommend it to all hospitals and public institutions."

(Signed) W. O. DUNHAM, M.D.,
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"The advantages of this wrapper are readily appreciated, and I predict that in a comparatively short time the Sevigne Bread Company will be the most extensively known concern of its kind in the United States."

(Signed) W. S. JERNEGAN, M.D.,
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PREPARED WITH FRESH COW'S MILK
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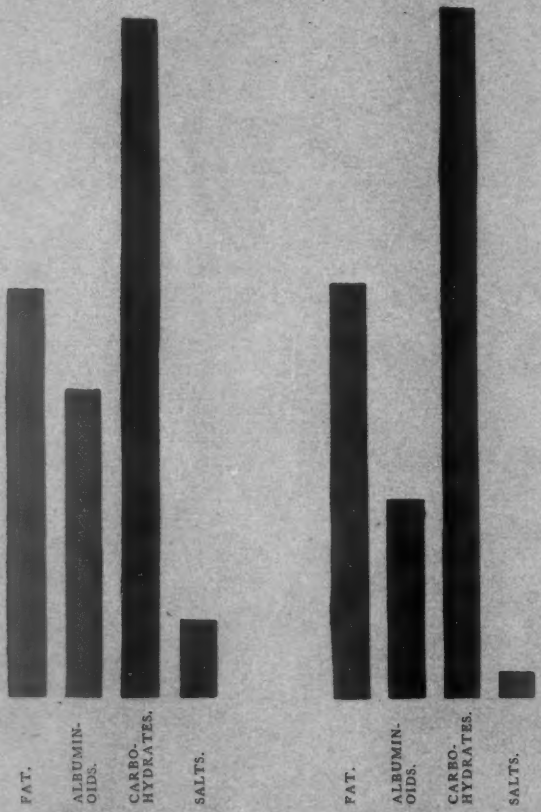

MELLIN'S FOOD AND MILK.

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